

REMARKS

By the present Response, Applicant has submitted several additional claims for consideration by the Examiner. These claims are submitted to be patentable over the references cited by the Examiner based on the combination of features recited therein. Accordingly, consideration and an indication of the allowability of claims 7-12 is respectfully request.

In the outstanding Official Action, the Examiner rejected claims 1, 2 and 6 under 35 U.S.C. § 102(b) as being anticipated by BROOME et al. (U.S. Patent No. 6,088,322).

Claims 1, 2, 5 and 6 were rejected under 35 U.S.C. § 102(b) as being anticipated by YOO et al. (U.S. Patent No. 6,043,912).

Claims 3 and 4 were rejected under 35 U.S.C. § 103(a) as being unpatentable over BROOME et al. and also under 35 U.S.C. § 103(a) as being unpatentable over YOO et al.

Applicant traverses each of the above rejections and submits that they are inappropriate with respect to the combination of features recited in each of Applicants claims. Accordingly, Applicant respectfully requests reconsideration and withdrawal of each of the outstanding rejections together with an indication of the allowability of all the claims pending in the present application in due course. Such action is respectfully requested and is now believed to be appropriate and proper.

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According to the features of the present invention as recited in claim 1, an objective lens for an optical pick-up includes at least one surface that is an aspherical surface. The at least one surface is divided into an effective area and an outer area which is outside of the effective area. The effective area and the outer area are configured such that a predetermined gap exists between a spherical aberration of a light beam passing through the effective area and a spherical aberration of a light beam passing through the outer area. Further, a diffraction lens structure is formed on the at least one surface within the effective area. The outer area is connected with a base curve which has a macroscopic shape of the at least one surface within the effective area. Accordingly, a light beam passing through the effective area forms a beam spot on a predetermined surface while a light beam passing through the outer area is diffused on the predetermined surface, in comparison with the beam spot formed by the light beam passing through the effective area.

It is respectfully submitted that the above-recited combination of features is not taught, disclosed nor rendered obvious by either BROOME et al. or YOO et al. applied by the Examiner.

Moreover, as recited in claim 6, the present invention is further directed to an objective lens for an optical pick-up wherein having at least one surface is formed as an aspherical surface. The at least one surface is divided into an effective area and an outer area which is positioned outside of the effective area. A diffraction lens structure is formed on

the at least one surface within the effective area. The outer area is connected with a base curve which is a macroscopic shape of the at least one surface within the effective area. The effective area and the outer area are configured such that a light beam passing through the effective area forms a beam spot on a predetermined surface while a light beam passing through the outer area is diffused on the predetermined surface.

It is respectfully submitted that the combination of features recited in claim 6 is also not taught, disclosed nor rendered obvious by either BROOME et al. or YOO et al. Accordingly, reconsideration and withdrawal of each of these rejections is respectfully requested, in due course.

With reference to Figs. 1A, B, and C, the objective lens 10 has a first surface 11 which is a rotationally symmetrical aspherical surface with a diffractive lens structure thereon. The first surface 11 is divided into an inside area  $R_{in}$  which serves as an effective area of the lens and an outside area  $R_{out}$  which is outside the perimeter of the effective area of the objective lens.

As disclosed in the present application, the objective lens is configured to be used as an optical pick-up for various types of optical disks such as, e.g, CD, CD-R and DVD. In furtherance of this purpose, the inside area  $R_{in}$  is divided into a common area RC and an exclusive area RE. The common area RC converges a light beam at a low NA which is necessary and sufficient for an optical disk having a low recording density, such as a CD or

a CD-R. Both the common area as well as the high NA exclusive area RE converge a light beam at a high NA which is necessary for an optical disk having a high recording density, such as a DVD. As an example, the common area RC is within a circle at which a light beam whose NA is .45-.50 passes and the high NA exclusive area RE, which is outside of the common area RC, is inside a circle at which a light beam whose NA is about .60 passes.

The outside area  $R_{out}$  is configured as a continuous surface (i.e., without steps) and continuously connects with a macroscopic base curve of the outer portion of the effective area  $R_{in}$  as indicated by the dashed lines in Fig. 1C. As a result of this configuration, a gap in the spherical aberration is generated between the inside area  $R_{in}$  and the outside area  $R_{out}$ . In particular, the gap of the spherical aberrations can be set to be about 10 micrometers, for example, so that the light beam passing through the outside area  $R_{out}$  is diffused while a beam spot is formed by the light beam passing through the inside area  $R_{in}$ .

Because the outer area is connected with a base curve of the effective area so that light passing through the outer area is diffused, the objective lens provides a limiting numerical aperture of a predetermined value such as, for example,  $NA=0.60$ . Accordingly, when using the objective lens of the present invention in an optical pick-up, it is unnecessary to employ an aperture stop member in the optical pick-up because the structure of the lens itself provides a limitation on the numerical aperture.

In rejecting claims 1, 2 and 6 under 35 U.S.C. § 102(b) as being anticipated by BROOME et al., the Examiner asserted that the effective area and the outer area are formed such that a predetermined gap is caused between a spherical aberration of a light beam passing through the effective area and a spherical aberration of a light beam passed through the outer area. The Examiner asserted that this feature is described in column 4, lines 9-26. It is respectfully submitted that the Examiner is incorrect. Column 4, lines 9-26 are unrelated to a predetermined gap between the spherical aberration of a light beam passed through the effective area and the spherical aberration of a light beam passed through the outer area. The portion of BROOME et al. referenced by the Examiner discloses that the .60 NA introduces nearly 2.4 times the spherical aberration that the .45 NA introduces. This portion of the disclosure does not make any reference to, teach or render obvious the feature for which the Examiner relies thereupon. Accordingly, for at least this reason, it is respectfully submitted that BROOME et al. is an inappropriate basis for the rejection of any of the claims in the present application.

Moreover, it appears that the surface upon which a "diffractive" is imposed is a spherical surface rather than an aspherical surface as recited in Applicant's claim. In this regard, the Examiner's attention is respectfully directed to BROOME et al., column 5, lines 44-47. Therein, the first surface 121 is disclosed to be aspheric while the second surface 122 has a "diffractive surface imposed on a spherical base curve". For this additional reason, it

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is respectfully submitted that BROOME et al. is an inappropriate basis for the rejection of any of the claims in the present application.

Yet additionally, and contrary to the Examiner's assertion, BROOME et al. at column 7, lines 23-28 does not disclose that the light beam passing through the outer area is diffused on a predetermined surface in comparison with a beam spot.

For each of the above-noted reasons and certainly for all of the above-noted reasons, it is respectfully submitted that BROOME et al. is an inappropriate basis for the rejection of any of the claims in the present application under 35 U.S.C. § 102 or even under 35 U.S.C. § 103.

The Examiner's rejection of claims 1, 2, 5 and 6 as anticipated under 35 U.S.C. § 102(b) by YOO et al. is similarly flawed. The Fig. 7 embodiment of YOO et al. which apparently shows an objective lens formed integrally with a holographic ring lens, contains no disclosure that the surface upon which the diffraction rings are formed is aspherical. Additionally, in YOO et al., the wavelength of the beam passing through the region F (353) outside the region a (351) of the holographic lens is diffracted and that region F is also part of the holographic ring lens. Nevertheless and contrary to the Examiner's assertion, YOO et al. does not disclose or suggest the areas as defined in Applicant's claims.

Moreover, in the present invention, as reflected in the claims, the outer area is a refractive surface without a diffractive lens structure and is configured to be connected with a base curve of the effective area. This feature of Applicant's claim is not disclosed, taught nor rendered obvious by YOO et al.

Nor, contrary to the Examiner's assertion, is there any support in YOO et al. for the "predetermined gap" recited in Applicant's claim 1.

For each of these reasons and certainly for all of these reasons, it is respectfully submitted that YOO et al. is also an inappropriate basis for the rejection of any of the claims in the present application.

Accordingly, Applicant respectfully requests reconsideration of each of the above-noted rejections together with an indication of the allowability of all the claims pending in the present application.

The Examiner's rejection of claims 3 and 4 under 35 U.S.C. § 103 as unpatentable over BROOME et al. and YOO et al. is noted. However, the Examiner's assertion of obviousness is inappropriate, particularly where, as here, the primary references do not disclose any gap whatsoever. The Examiner's assertion of obviousness as related to optimum values applies only in a situation where it is known in the prior art that the parameter that is being optimized is a significant parameter. In the present situation, this is not true and thus

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the Examiner's reliance on *In re Boesch* is misplaced. Thus, the Examiner's rejection of claims 3 and 4 is also inappropriate.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the outstanding rejections together with an indication of the allowability of all the claims in the present application, in due course.

#### SUMMARY AND CONCLUSION

Applicant has made a sincere effort to place the present application in condition for allowance and believes that he has now done so. Applicant has submitted several additional claims for consideration by the Examiner. Applicant has traversed the Examiner's rejection and has shown the same to be inappropriate. Applicant has discussed the features of Applicant's invention both as disclosed as well as with reference to the features recited in the claims. Applicant has discussed the disclosure of each of the references relied upon by the Examiner and has shown that these references are inadequate and insufficient to meet the terms of Applicant's claims. Applicant has pointed out the significant and substantial shortcomings and deficiencies of the references. Applicant has discussed the recited features of Applicant's claims and has shown how these features are not taught, disclosed nor rendered obvious by any of the references cited by the Examiner against the claims of the present application. Accordingly, Applicant has provided a clear evidentiary basis



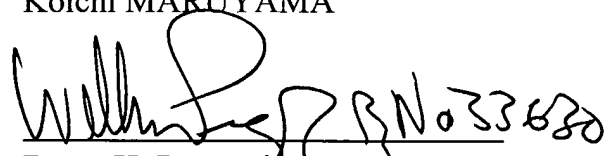
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supporting the patentability of all the claims in the present application and respectfully requests an indication to such effect in due course.

Applicant has submitted several additional claims for consideration by the Examiner and with respect to these claims, has provided a basis for the patentability thereof. Accordingly, Applicant respectfully requests reconsideration of each of the rejections and an indication of the allowability of all the claims pending in the present application, in due course. Such action is now believed to be appropriate.

Should the Examiner have any questions or comments regarding this Response, or the present application, the Examiner is invited to contact the undersigned at the below-listed telephone number.

Respectfully submitted,  
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